ZLP128ICE01ZEM/G

Crimzon® In-Circuit Emulator

User Manual

UM018408-0408

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Revision History

Each instance in the revision history table reflects a change to this document from its previous revision. For more details, refer to the corresponding pages and appropriate links in the following table.

Date	Revision Level	Description	Page Number
April 2008	08	Added note to Introduction. Replaced Figure 6 and Figure 12.	1, 9, and 17
January 2008	07	Updated Table 1, Sample Project, Using an Event to Stop Execution, and Collecting Trace After an Event, sections.	2, 19, 22, and 24
September 2007	06	Updated Figure 13, Figure 15, and Connecting Crimzon ICE to OTP Programming Module (Optional).	21, 27, and 7
July 2007	05	Updated as per Zilog templates and Style Guide.	All
April 2007	04	Updated document product line by adding "/G".	i
February 2007	03	Added note under section Burn Code from an Existing Hex File.	29

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Introduction

Note: *This kit has been replaced by an improved version, ZCRMZNICE01ZEMG.*

Zilog's Crimzon® In-Circuit Emulator (ICE) provides Crimzon chip family emulation with a Trace and Event system for program debugging using Zilog Developer Studio II (ZDS II) development tools. Use the included OTP programming module to burn your design code to OTP devices.

Kit Features

The kit features include:

- Emulation and OTP Programming support for the Crimzon family
- Emulation Pod and adapters for 20- and 28-pin Packages
- IR Development Board
- Trace and Event System
- Ethernet and USB Interface
- Up to 8 MHz Clock Frequency
- 2.0–3.6 V V_{DD}
- ZDS II
- Assembler and Full ANSI C Compiler
- Documentation
- Sample OTP Devices

System Requirements

Table 1 lists the system requirements for running ZDS II.

Table 1. ZDS II System Requirements

Recommended Configuration	Minimum Configuration
PC running Windows XP Professional	PC running Windows 98 SE
Pentium III/500 MHz processor	Pentium II/233 MHz processor
128 MB RAM	96 MB RAM
65 MB hard disk space	25 MB hard disk space (documentation not included)
Super VGA video adapter	Super VGA video adapter
CD-ROM drive	CD-ROM drive
Ethernet port	Ethernet port
USB high-speed or full-speed port	
One or more RS-232 communications ports	One or more RS-232 communications ports
Internet browser (Internet Explorer or Netscape)	Internet browser (Internet Explorer or Netscape)

Software Installation

Follow the steps below to install ZDS II with ANSI C-Compiler:

1. **DemoShield** program available in the ZDS II installation CD launches automatically. If it does not automatically launch, go to the root of the CD-ROM and double-click the `launch.exe` file.

2. **DemoShield** provides several installation options to install ZDS II, select **Install ZDS II**. You can install other software and accompanying documentation later.
3. Follow the instructions on the screen to complete the installation.

To receive free technical support, register your software at www.zilog.com. To access the registration page, open the **Support** menu at the top of the web page and click **Product Registration**.

Hardware Installation

The Crimzon ICE and Programming System features an Ethernet interface, a USB interface, and an RS-232 serial port. Hardware installation consists of the following:

- Connecting Target Pod
- Connecting Crimzon ICE to the Target Pod
- Connecting Crimzon ICE to OTP Programming Module (Optional)
- Connecting Crimzon ICE to a PC

You have to reconfigure network settings on the PC or on the Crimzon ICE before using the emulator.

Connecting Target Pod

Use an appropriate target pod and pin converter to connect the Crimzon ICE to the target board. Figure 1 on page 4 displays the Crimzon ICE top panel connectors and Figure 2 on page 4 displays the IR development board included with the kit. The 20-/28-/40-PDIP target pods plug into the associated PDIP sockets on the target board. For example, if your target board has a 20-SOIC socket, mate the 20-PDIP target Pod onto the 20-PDIP to 20-SOIC converter. Then install the target pod and converter assembly into the board's 20-SOIC socket.

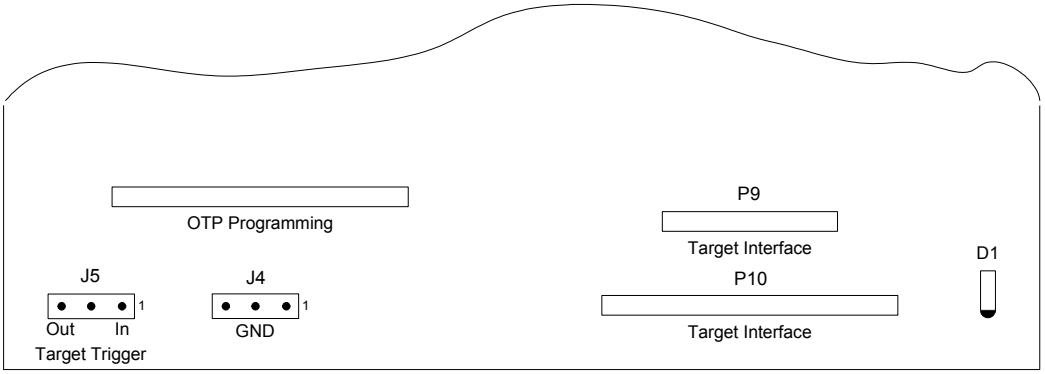


Figure 1. Crimzon ICE Top View

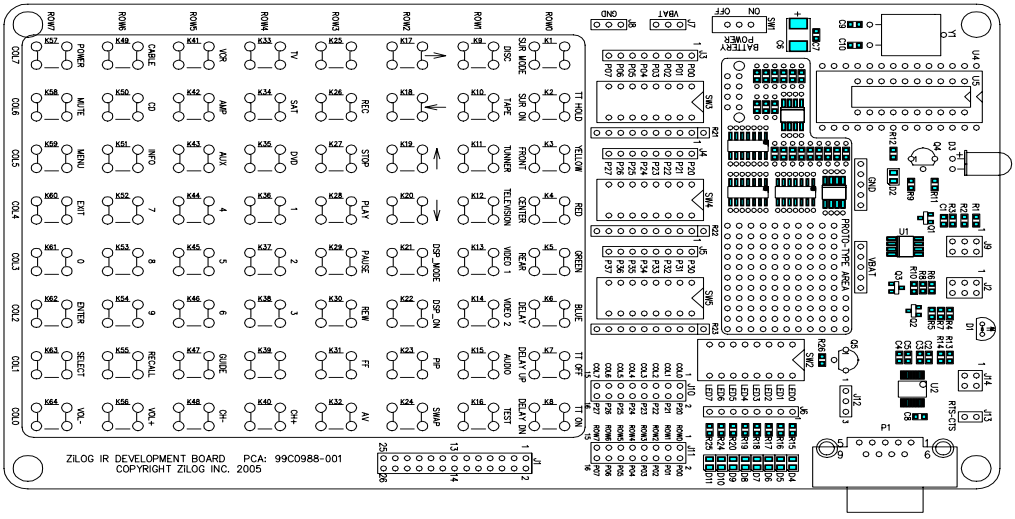


Figure 2. IR Development Board

To set up the 20-/28-PDIP emulation pods for use in specific applications of Port P31 on the ZLP128ICE01ZEM/G, see Figure 3 and Table 2.

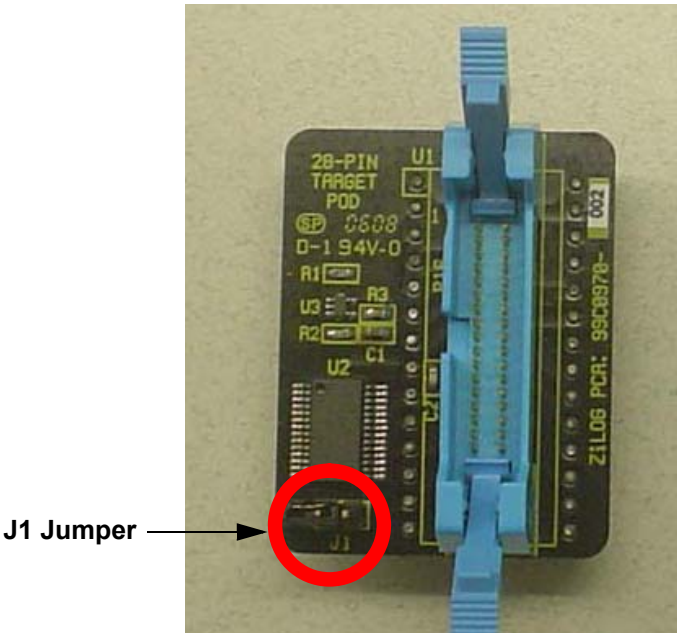


Figure 3. Location of J1 Jumper

Table 2. Jumper Settings

Jumper	Port P31 Function
J1 ON	Infrared (IR) Amplifier
J1 OFF	Digital/Analog

The jumper settings provided in Table 2 on page 5 applies to the 20-/28-PDIP emulation pods shipped along with the following:

- ZLP128P2X10ZAC/G Rev. A or later
- ZLP128ICE01ZEM Rev. G or later
- ZLP128ICE01ZEMG Rev. A or later

Note: *For ZLP128ICE01ZEM Rev. F or earlier releases, refer to the documentation shipped with the kit for the emulation pods. If you have any question, contact Zilog® technical support at*

http://support.zilog.com/support/custom_login.asp

Connecting Crimzon ICE to the Target Pod

After installing the appropriate target pod (and converter, if required) onto the target development board, connect the Crimzon ICE to the target pod as follows:

- For 40-PDIP and 48-SSOP target pods:
  - Connect the 20-circuit cable from P9 on the emulator to P2 on the 40-PDIP target pod. (The 20-circuit cable is included in the 40-/48-pin accessory kit, ZLP323ICE01ZAC, ordered separately.)
  - Connect the 34-circuit cable from P10 on the emulator to P1 on the 40-PDIP target pod.
- For 20-PDIP and 28-PDIP target pods:
  - Connect the 34-circuit cable from P10 on the emulator to P16 on the target pod. (Emulator connector P9 is not used.)

Connecting Crimzon ICE to OTP Programming Module (Optional)

After developing and debugging your software, follow the steps below to connect the Crimzon ICE to the OTP programming module so that you can burn your code onto the OTP chip:

1. Connect the 40-circuit ribbon cable from the Crimzon ICE OTP Programming connector (P8) to connector P8 on the ICE OTP programmer module.
2. The 40-PDIP ZIF socket on the OTP programming module is designed to accept 40-PDIP OTP chips. The OTP programming adapters supplied with the Crimzon ICE allow you to adapt the ZIF socket to accept 20-/28-SOIC, 20-/28-SSOP, 20-/28-PDIP chip packages.

After installing the OTP chip into the ZIF socket (or programming adapter), you can program the chip using the instructions provided in OTP Programming on page 26.

Connecting Crimzon ICE to a PC

You can connect the Crimzon ICE to a host PC using either an Ethernet or USB port. To connect the Crimzon ICE to a host PC using Ethernet, see Ethernet Port Connection on page 7. To connect the Crimzon ICE to a host PC using USB port, see USB Port Connection on page 15.

Ethernet Port Connection

Follow the steps below to connect the Crimzon ICE to a host PC using Ethernet:

1. Connect a CAT-5 crossover cable from the PC to the Ethernet port on the Crimzon ICE, see Figure 4 on page 8.

Note: *You can connect the ICE to an Ethernet hub using a CAT-5 patch cable.*

2. Connect the serial COM port on the PC to the SETUP serial port on the Crimzon ICE using the DB9-to-DB9 serial cable, see Figure 5.

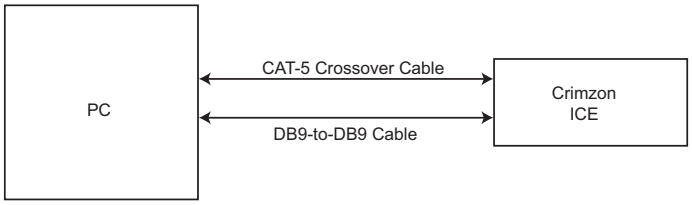


Figure 4. Connecting a PC to the Crimzon ICE

Figure 5. Crimzon ICE Rear Panel

Caution: *Ensure that the target board is not powered ON.*

3. Connect a 5 V DC power supply to the Crimzon ICE. The 3.3 V DC and 1.8 V DC power LEDs must illuminate, see Figure 5. Contact Zilog® support at www.zilog.com if there is any problem.

Figure 6. Crimzon ICE Front-Panel

Setting Up Ethernet Communications

The default IP address and subnet mask of the Crimzon ICE are 192.168.1.50 and 255.255.255.0, respectively. To enable communication between the PC running ZDS II and the Crimzon ICE, you must either change the PC's Ethernet settings to match those of the Crimzon ICE or vice versa.

If using the PC in a stand-alone configuration, set the PC's IP address to 192.168.1.21 and its subnet mask to 255.255.255.0. For more details, see Changing the PC's Settings to Match the Crimzon ICE on page 10.

In a networked environment, set the Crimzon ICE IP address and subnet mask to match the network setup. For more details, see Changing Crimzon ICE Settings on page 14.

Changing the PC's Settings to Match the Crimzon ICE

Follow the steps below to change the PC's Ethernet settings:

Note: *The following instructions are for MS Windows XP. If your Windows OS is different, refer to your MS Windows OS online help for details.*

1. Open the Windows Control Panel and double-click the **Network Connections** icon, see Figure 7.

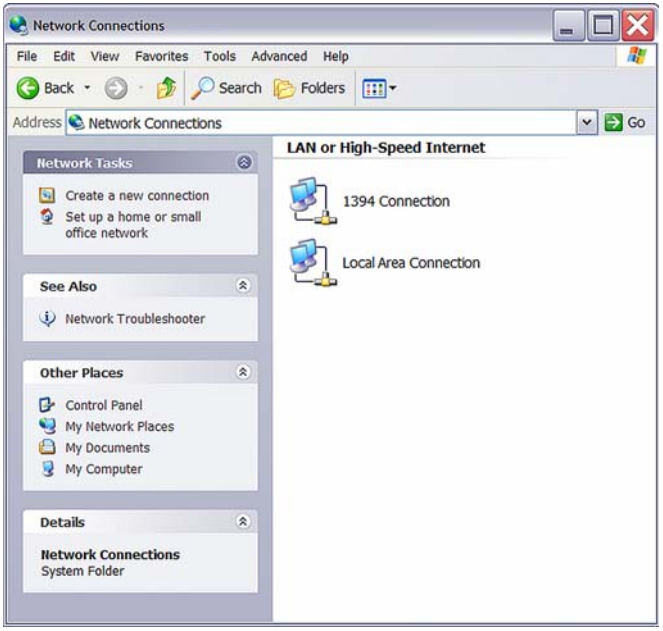


Figure 7. Network Connections

2. In the panel labeled **LAN or High-Speed Internet**, double-click the **Local Area Connection** icon. The **Local Area Connection Status** window appears, see Figure 8.

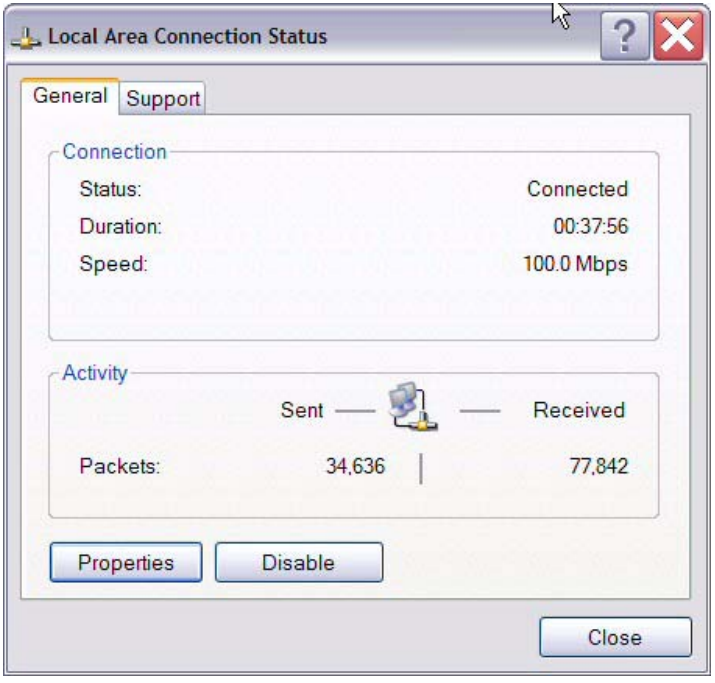


Figure 8. Local Area Connection Status Window

3. In the **Local Area Connection Status** window, click **Properties** button. The **Local Area Connection Properties** dialog box appears, see Figure 9.

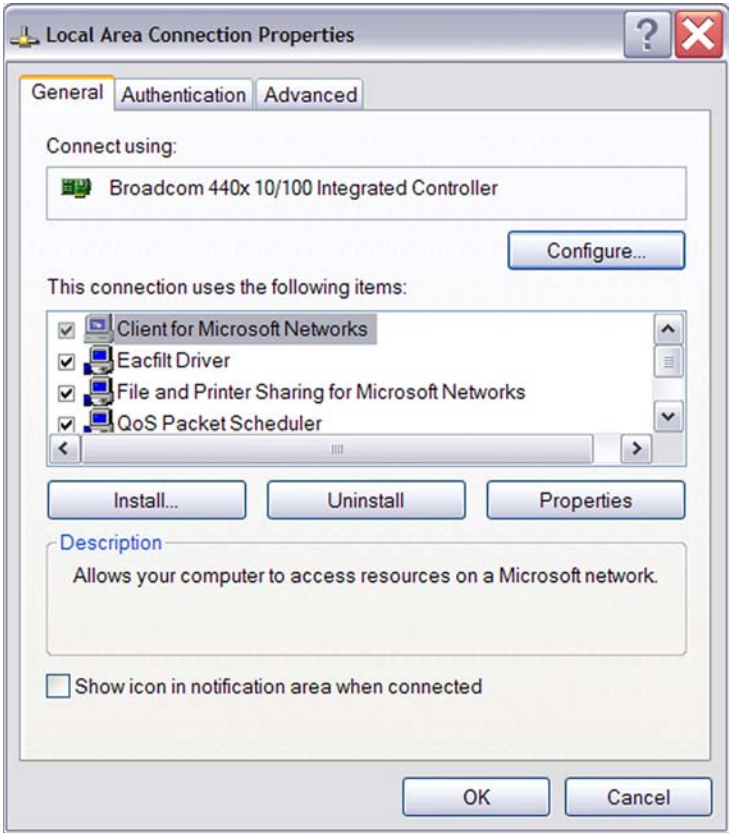


Figure 9. Local Area Connection Properties Dialog Box

4. Select **Internet Protocol (TCP/IP)** from the scroll down list, and click **Properties** button. The **Internet Protocol (TCP/IP) Properties** dialog box appears, see Figure 10.

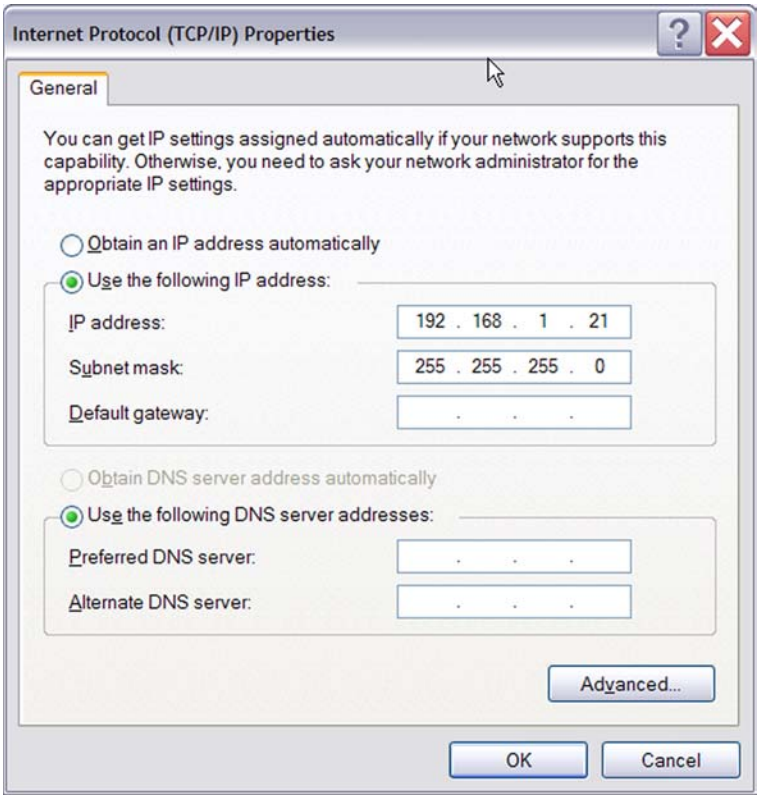

Internet Protocol (TCP/IP) Properties
General
You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.
Obtain an IP address automatically
Use the following IP address:
IP address:
192 . 168 . 1 . 21
Subnet mask:
255 . 255 . 255 . 0
Default gateway:
Obtain DNS server address automatically
Use the following DNS server addresses:
Preferred DNS server:
Alternate DNS server:
Advanced...
OK
Cancel

Figure 10. Internet Protocol Properties Dialog

5. Enter the IP address and subnet mask to match those displayed in Figure 10 on page 13. Leave the remaining fields blank. In this example, an IP address of 192.168.1.21 and a subnet mask of 255.255.255.0 are being assigned to the PC. These values connect the PC to the same network as the Crimzon ICE unit.
6. Click **OK** and restart the PC.

Note: *To execute a sample project, see Sample Project on page 19.*

Changing Crimzon ICE Settings

Follow the steps below to change the Crimzon ICE Settings:

1. Connect the serial port of the PC to the Crimzon ICE serial port using the DB9-to-DB9 serial cable.
2. Launch HyperTerminal on the PC by selecting **Start → Programs → Accessories → Communications → HyperTerminal**. The **Connection Description** dialog box appears.
3. Enter the name for a new connection in the **Connection Description** dialog box, and click **OK** to open the **Connect To** dialog box.
4. In the **Connect To** dialog, set the **Connect Using** drop-down menu to match the COM port to which the Crimzon ICE is connected. Click **OK**.
5. A **COM Properties** dialog appears. Enter the following port settings and click **OK**. HyperTerminal should automatically attempt a connection. Otherwise, select **Call → Connect.**

Bits per second	57600
Data bits	8
Parity	None
Stop bits	2
Flow control	None

6. When the emulator is turned on or reset, a Crimzon ICE console boot-up message appears in the HyperTerminal. A typical boot-up message is shown below:

```
ZiLOG Z8 LXM ICE
Firmware Version 2.0, Build (Aug 22 2005 08:14:37)
Copyright (C) 2005 ZiLOG, Inc. All Rights Reserved.
Adding emac driver...
Attempting to establish Ethernet connection.
10 Mbps Half-Duplex Link established
```

```
IP Address: 10.1.7.95
IP Subnet: 10.1.0.0/255.255.0.0
IP Gateway: 10.1.1.254

Press 'Ctrl-Z' to enter configuration mode
```

7. Press **Ctrl-z**. The emulator command prompt appears:
   `Z8 LXM ICE %`

Note: *The emulator console prompt is not case-sensitive.*

Type `help` or `?` at the emulator command prompt to see a list of available commands. For information on the description of the complete Crimzon ICE commands, see Appendix A–Crimzon ICE Commands on page 40.

8. When you have finished configuring the emulator, type **exit** to exit the command shell.
9. Press **Alt+F4** to exit HyperTerminal.
10. Type **reboot** and press **Return** or cycle the power on the Crimzon ICE for the new settings to take effect.
11. The hardware is now configured and ready for application development.

Note: *To execute a sample project, see* Sample Project *on page 19*.

USB Port Connection

To connect the Crimzon ICE to your PC using a USB port, load the appropriate driver from the ZDS II installation directory or CD-ROM provided with your emulator. ZDS II software is available for download from www.zilog.com. The procedure of loading the appropriate driver, depends on your Windows OS version.

Windows XP

Follow the steps below to connect the Crimzon ICE to a host PC using USB Connection for Windows XP OS version:

1. Connect the Crimzon ICE to the host PC using the supplied USB cable. See Figure 11 for Crimzon ICE rear panel connection.

Figure 11. Crimzon ICE Rear Panel

Caution: *Ensure the target board is not powered ON.*

2. Connect a 5 V DC power supply to the Crimzon ICE. The 3.3 V DC and 1.8 V DC power LEDs should illuminate, see Figure 5 on page 8. Contact Zilog® support at www.zilog.com if there is any problem. In Windows, the **Found New Hardware** wizard should activate automatically.

Figure 12. Crimzon ICE Front Panel

3. In the wizard, select **Install from a list or specific location (Advanced)**; click **Next**.

Note: *If the Windows Logo testing dialog appears, select* **Continue Anyway.**

4. Select **Search for the best driver in these locations** and include those locations in the search.
5. Browse to one of the following driver directories:
   `<ZDS II Installation Directory>\device drivers\USB`
   `<ZDS II Installation CD>\Device Drivers\USB`
6. Click **Next**.
7. Select the appropriate driver, and click **Next**.
8. Click **Finish** to complete the installation.

Windows 2000/Windows 98SE

Follow the steps below to connect the Crimzon ICE to a host PC using USB Connection for Windows 2000/Windows 98SE OS version:

1. Connect the Crimzon ICE to the host PC using the supplied USB cable. See Figure 11 on page 16 for Crimzon ICE rear panel connection.

Caution: *Ensure the target board is not powered ON.*

2. Connect a 5 V DC power supply to the Crimzon ICE. The 3.3 V DC and 1.8 V DC power LEDs should illuminate, see Figure 5 on page 8. Contact Zilog® support at www.zilog.com if there is any problem. In Windows, the **Found New Hardware** wizard must activate automatically.
3. In the wizard, click **Next**.
4. Select **Search for a suitable driver for my device (Recommended)**; click **Next**.
5. Select **Specify a location**, click **Next**.
6. Browse to one of the following driver directories:
   `<ZDS II Installation Directory>\device drivers\USB`
   `<ZDS II Installation CD>\Device Drivers\USB`
7. Click **Next**.
8. Select the appropriate driver, and click **Next**.
9. Click **Finish** to complete the installation.

Sample Project

After installing the ZDS II software and setting up the hardware, you are ready to execute the sample software project to verify proper emulator operation and to test with the Trace and Event system. This section describes how to run the emulator in the in-circuit mode.

Notes:
1. *If you run the emulator with a target attached, the emulator's voltage comparator is designed to serve as a target power sensor, and not as a precision voltage measurement device. If you set the Target VCC to match your target and the target's voltage drifts downward, the power sensor may no longer detect it. The emulator may therefore not connect to the target. In such cases, set the Target VCC voltage progressively lower until a proper connection is established.*
2. *If the IR development board supplied with the kit is used, see* Technical Information on the IR Development Board on page 34 *for technical details and* Table 6 on page 39 *for jumper settings.*

The sample project `ZLP12840100kit ver 1.zdsproj` is included in the ZDS II sample directory, located in:

```
c:\Program Files\ZiLOG\ZDSII_<product>_<version>\samples\<processor type>_<demo name>
```

Start ZDS II for the Crimzon ICE Emulator by selecting **Start** → Zilog **ZDS II - Crimzon Emulator `<software_version>`** and follow the instructions below to run `ZLP12840100kit ver 1.zdsproj`, the sample project.

1. Ensure that the Crimzon ICE and the target board are powered ON.
2. Use **File** → **Open Project** menu option to open the sample project file located at the following path:

   ```
   c:\Program Files\ZiLOG\ZDSII_CrimzonGP_Emulator_<version>\samples\ZLX12840_IRRemote\src\ZLP12840100kit ver 1.zdsproj
   ```

3. To open the source file, double-click on `irmain.s` file in the **Project Files** Window.
4. Select **Project** → **Settings**.
5. In the **General** tab, set the **CPU Family field** to `ZLP12840` and the **CPU field type** to `ZLP12840X2828`.
6. Follow either of the below options to connect the emmulator and the PC:
   - If you are using Ethernet communications between the emulator and the PC:
     – In the **Debugger** tab, see Figure 13 on page 21, select **EthernetEmulator** from the debug tool area and click **Setup** button.
     – The **Ethernet Configure Driver** dialog box appears. The IP Address field displays a default IP address, 192.168.1.50. Enter the Crimzon ICE IP address if it has been modified. Leave the Port setting at 4040.
     – Click **OK**.
   - If you are using USB communications between the emulator and the PC:
     – In the **Debugger** tab, see Figure 13 on page 21, select **USBEmulator** from the debug tool area and click **Setup** button.
     – The **USB Configure Driver** dialog box appears. The Serial Number field displays a serial number for the USB interface. Click **OK**.

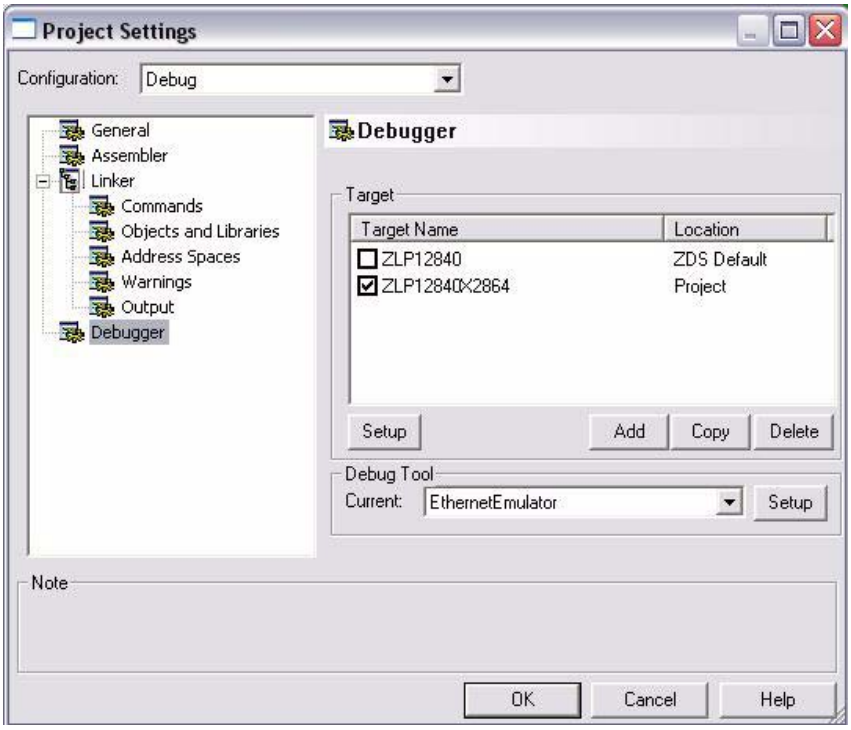


Figure 13. Project Settings, Debugger Tab

7. In the **Debugger** tab, click **Setup** button from target area, **Configure Target** window appears.
8. Set the **Voltage** drop-down menu to **Standalone** if the emulator is not connected to a target. If the emulator is connected to a target, set the **Voltage** drop-down menu to the voltage appropriate for the connected target.
9. In **Clock Source** section, select the **Internal** radio button if the emulator is not connected to a target, and set the **Clock Frequency** to 7.5 MHz.

10. If the emulator is connected to a target, select the **External** radio button and the appropriate frequency.
11. In the **Programming Option Bits** section, ensure that none of the options are selected.
12. Click **OK**.
13. Click **OK** in the **Project Settings** window and you will be prompted to rebuild the affected files, click **Yes** to rebuild the project. (You can also rebuild later by pressing F7.)
14. Click **Go** button to connect to the target and start debugging.
15. Click **Break** button and **Stop Debugging,** to exit the debug session.

Collecting a Trace

Follow the steps below to obtain a sample trace:

1. Collect a simple trace by starting the program, stopping it, and viewing the trace buffer. Click **Go** button in the toolbar, wait a moment, and then click **Break** button. The Trace buffer acts as a ring buffer that continuously fills and then overwrites itself until you stop execution.
2. Select the **Trace** window by selecting **View** → **Debug Windows** → **Trace** and click **Get Frames** to display the trace information.

Using an Event to Stop Execution

Events allow you to stop execution based on more complex conditions than a simple instruction address.

The following events are available:

- Program counter position, with mask
- Data on Port0 (state of its pins), with mask

- Data on Port2 (state of its pins), with mask
- Data on Port3 (state of its three input pins), with mask
- External Trigger In (0 or 1)

Follow the steps below to setup and execute an event:

1. Select **Tools** → **Trace and Event System**. The **Trace and Event System** window appears, see Figure 14.
2. Check **Enable event system** check box and in the **Then:** section, check **Break** radio button.
3. In the **When:** section, check **Program Counter** check box and set **Program Counter** to `0044` and **Mask** to `FFFF`.

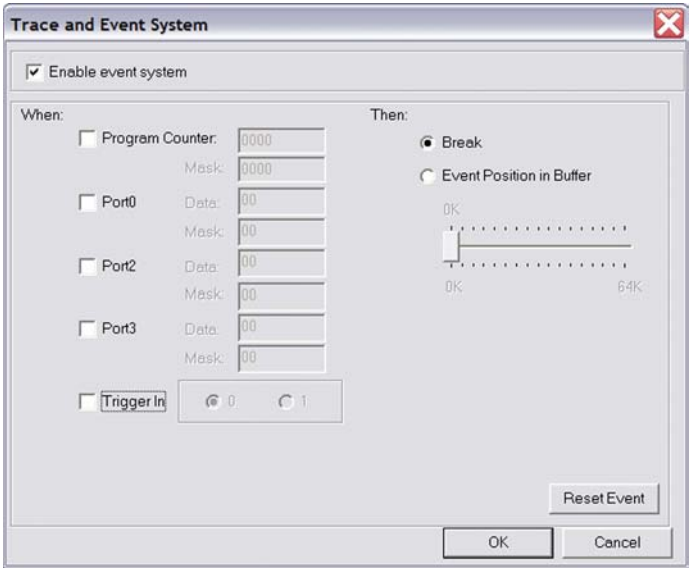


Figure 14. Trace and Event System Window

4. Click **OK**.

5. Open the Trace window by selecting **View** → **Debug Windows** → **Trace**.
6. In the **Trace** window, click **Clear Trace** button.
7. To reset the **Debugger** click **Reset** button in the toolbar, or select **Debug** → **Reset**.
8. Click **Go** button or select **Debug** → **Go** to run the **Debugger**.
9. When the program counter reaches `0044`, execution stops on event match.
10. Click **Get Frames** to display the trace information.

Collecting Trace After an Event

The Trace and Event System is also used to capture trace data after an event. Set up the events as described in Using an Event to Stop Execution on page 22. In the **Then:** section, check **Event Position in Buffer** radio button instead of **Break**. Use the slider bar to select the number of cycles from the 64K buffer to be captured after the event.

When the event is detected, the selected number of cycles after the event are collected. Execution stops after the cycles are collected. After the event, selected number of cycles are left in the trace buffer.

Single-Stepping Through a Program

ZDS II provides a simple mechanism for single-stepping through a program. Follow the steps below to single-step through a program:

1. Reset the program to `main()` by either clicking **Reset** icon or by selecting **Debug** → **Reset**. Set the Reset to `main()` option by selecting **Tools** → **Options**. In the **Options** window, select the **Debugger** tab and select the **Reset** to symbol ‘main’ check box.
2. To step through the program one instruction at a time, use F11 or click **Go** button in the **Debug** toolbar or select **Build** → **Debug** → **Step Into**.

Peek/Poke Registers

Follow the steps below to read the emulator register contents:

1. ZDS II makes it easy for you to set and read emulator register contents. With the `ZLP12840100kit ver 1.zdsproj` project open and ZDS II connected to the emulator (target), select **View → Debug Windows → Registers**.
2. In the **Registers** window, double-click the value of any register and type in a new value.
3. Press **Enter**. The new value is displayed in red.

Refer to *ZDS II User Manual (UM0164)* on the ZDS II CD-ROM and the ZDS II online help for more information on setting and reading register values.

Peek/Poke Memory

Follow the steps below to set and read the peek/poke memory contents:

1. With the `ZLP12840100kit ver 1.zdsproj` project open and ZDS II connected to the emulator (target), select **View → Debug** Windows → **Memory**.
2. In **Memory** window, double-click the value you want to change and type in a new value. (Values begin in the second column after the Address column.)
3. Press **Enter**. The new value is displayed in red.

Refer to *ZDS II User Manual (UM0164)* on the ZDS II CD-ROM and the ZDS II online help for further information on setting, filling, and reading memory.

OTP Programming

Use the Crimzon ICE OTP Programming Module to burn your program onto a Crimzon family chip. There are two ways to burn an OTP chip:

1. Burn Code from the Current Project
2. Burn Code from an Existing Hex File

Note: *Do not connect to the emulator when programming windowed CDIP parts. See* Burn Code from an Existing Hex File *on page 29 when programming windowed CDIP parts.*

Burn Code from the Current Project

Follow the steps below to burn code from the current project built in ZDS II (loaded in emulator RAM):

1. Connect the OTP programming module to the emulator as described in Connecting Crimzon ICE to OTP Programming Module (Optional) on page 7.
2. Select the OTP chip to be burned and the appropriate package converter.
3. Install the package converter, if used, into the ZIF socket on the OTP programming module.
4. Install the OTP chip to be burned into the ZIF socket on the OTP programming adapter. Match pin 1 of the chip with pin 1 of the ZIF socket.
5. In ZDS II, open the project for the code to be burned onto the chip.

Note: *If you are currently in debugging mode, click* **Build → Debug → Stop Debug** *or press* **Shift-F5** *to stop debugging.*

6. In ZDS II, connect to the emulator by clicking the **Connect to Target** button.

7. Select **Tools** → **OTP Programming** to open the **OTP** window, see Figure 15.

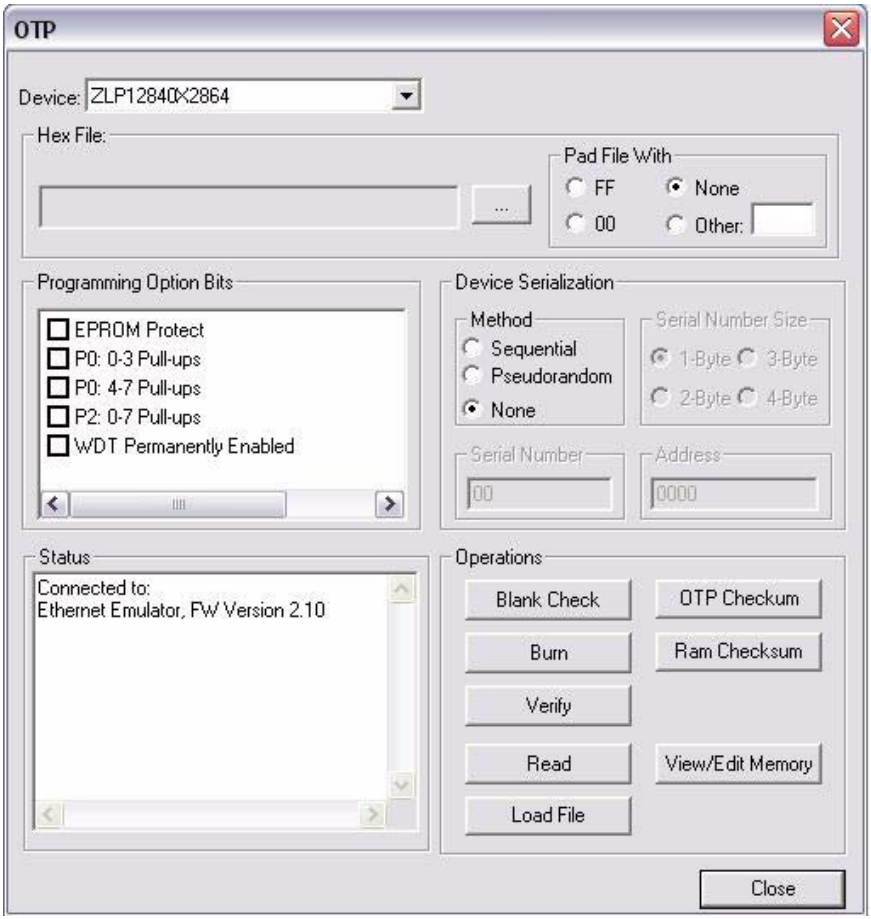


Figure 15. OTP Programming Window (ZDS II Current Project Example)

8. Click **Ram Checksum** button to calculate the checksum of the data in emulator RAM. Use this to compare with the OTP checksum after burning.
9. Select the option bits to be programmed in the **Programming Option Bits** area.
10. Select **None** button in the **Method** panel of **Device Serialization** to leave the serial number blank.
11. To load a serial number:
    - Select **Sequential** or **Pseudorandom** button in the **Method** panel. This determines how the serial number is incremented on subsequent burns.
    - Select the size of the serial number (1, 2, 3, or 4 bytes) in the **Serial Number Size** area.
    - Enter the starting serial number in the **Serial Number** field.
    - In the **Address** field, enter the address of the serial number.
12. Click **Blank Check** to verify that the OTP chip is actually blank.
13. Click **Burn** to program the OTP chip with the contents of emulator RAM. The OTP chip content value is also verified.
14. When the burn is complete, click **OTP Checksum** to calculate the checksum of data on the OTP chip and compare it to the **RAM checksum** calculated earlier.
15. Click **Close** to close the OTP Programming window.

Burn Code from an Existing Hex File

Follow the steps below to load an existing hex file into emulator RAM and burn an OTP chip:

1. Connect the OTP programming module to the emulator as described in Connecting Crimzon ICE to OTP Programming Module (Optional) on page 7.
2. Select the OTP chip to be burned and the appropriate package converter.
3. Install the package converter, if used, into the ZIF socket on the OTP programming module.
4. Install the OTP chip to be burned into the ZIF socket on the OTP programming adapter. Match pin 1 of the chip with pin 1 of the ZIF socket.

Note: *Stop any current debugging process by selecting* **Build → Debug → Stop Debug** *or press* **Shift-F5** *to stop debugging.*

5. In ZDS II, open the project for the code to be burned onto the chip.

6. Select **Tools** → **OTP Programming** to open the OTP window, see Figure 16.

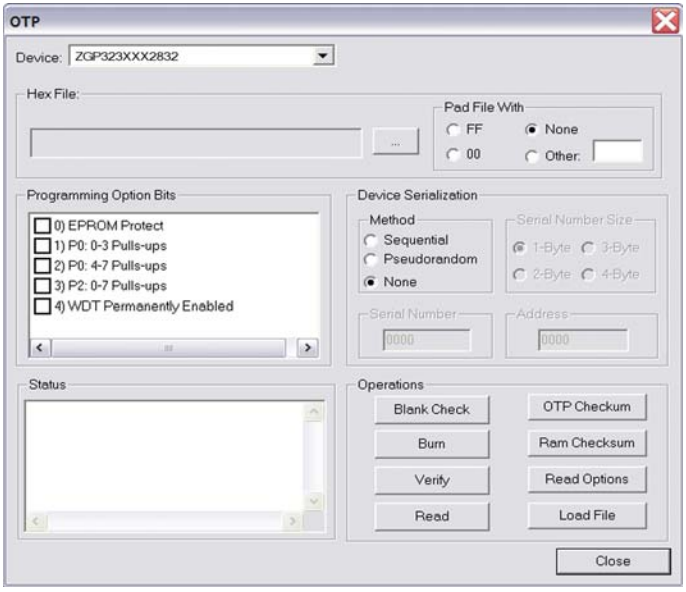


Figure 16. OTP Programming Window-Hex File Example

7. Select the appropriate target device from the **Device** drop-down menu.
8. In the **Hex File:** section, click ... button and select the hex file to be programmed on to the OTP chip.
9. If you do not want to pad the hex file, select **None** button in the **Pad File With** panel. Otherwise, select **FF**, **00**, or **Other** button. If you select the **Other** button, type the hex value to pad the file with in the text field provided with **Other**.
10. Click **Load File** to load the hex file into emulator RAM.

11. Click **Ram Checksum** to calculate the checksum of the data in emulator RAM. Use this to compare with the OTP checksum after burning.
12. Select the option bits to program in the **Programming Option Bits** area.
13. Select **None** button in the **Method** panel of **Device Serialization** to leave the serial number blank.
14. To load a serial number:
    - Select **Sequential** or **Pseudorandom** button. This determines how the serial number is incremented on subsequent burns.
    - Select the size of the serial number (1, 2, 3, or 4 bytes) in the **Serial Number Size** area.
    - Enter the starting serial number in the **Serial Number** field.
    - In the **Address** field, enter the address of the serial number.
15. Click **Blank Check** to verify that the OTP chip is actually blank.
16. Click **Burn** to program the OTP chip with the contents of emulator RAM. The OTP chip contents is also verified.
17. When the burn is complete, click **OTP Checksum** to calculate the checksum of data on the OTP chip and compare it to the RAM checksum calculated earlier.
18. Click **Close** to close the OTP Programming window.

LED Indicators

There are three sets of dual LED indicators on the Crimzon ICE, as described below:

1. The dual ICE RUN LED on the front panel, see Crimzon ICE Front-Panel on page 9, indicates emulator status. If the top LED is ON, the emulator is executing your system code. When the top LED is off, emulation has stopped. If the bottom LED is ON, the emulator is not functioning properly, contact technical support for assistance.
2. The dual 3.3 V DC/1.8 V DC LED on the rear panel, see Crimzon ICE Rear Panel on page 8, indicates the status of internal voltages. Both LEDs are normally illuminated when power is connected.
3. The dual LAN/LINK LED on the rear panel, see Crimzon ICE Rear Panel on page 8, indicates Ethernet status. The LINK LED indicates that the Ethernet connection is live. The LAN LED indicates that data is being transferred across the connected network.

External Interface Connectors

There are five external interface connectors (P8, P9, P10, J4, J5) on the Crimzon ICE as explained below:

- Connectors P9 and P10 are used to connect the emulator to the target pod and adapter board assembly, see Figure 1 on page 4.
- The OTP Programming connector P8 is used to connect the emulator to the OTP programming module.
- Connector J4 on the emulator front panel (see Figure 1 on page 4 and Figure 6 on page 9), provides a ground connection on all three pins.
- Connector J5 on the emulator front panel, see Figure 1 on page 4, provides access to the following functions:

– Pin 3 provides a HIGH external trigger out for use in triggering a device such as a logic analyzer or oscilloscope. Pin 3 is under software control, and can be activated through the ZDS II Trace and Event system. The trigger can be set to toggle or pulse.
– Pin 1 provides an input for an external HIGH or LOW trigger in, allowing use of an external trigger as an event for the ZDS II Trace and Event system.

Using J5 Pin 3, External Trigger Out

The Crimzon ICE external trigger out feature is always enabled. Set your Trace and Event system parameters, before executing the code. When the set up event occurs, pin 3 of connector J5 goes HIGH and stays HIGH as long as the event is active. Longer the event window, longer the trigger out stays HIGH.

Using J5 Pin 1, External Trigger In

The Crimzon ICE external trigger in feature can be enabled as follows:

- With the `ZLP12840100kit ver 1.zdsproj` project open in ZDS II as described in Sample Project on page 19, select **Tools** → **Trace and Event System**.
- In the **Trace and Event System** window, select an **Event** entry. In the **When** section, check **Trigger In** box.
- Select either 0 or 1 to trigger on LOW or HIGH, respectively (edge-triggering not supported).
- Click **OK** to set the **Trace and Event System** parameters. If you set trigger=1 in the Trace and Event System window, then a HIGH on pin 1 of connector J5 generates an event in the ZDS II **Trace and Event System**. If you set trigger=0, then a LOW on pin 1 of connector J5 generates an event.

Crimzon Package Support and Ordering Information

The Crimzon ICE supports the packages listed in Table 3.

Table 3. Crimzon Package Support

Chip Package	For OTP Programming Order	For In-Circuit Emulation, Order
20 PDIP	Included in ZLP128ICE01ZEM kit	Included in ZLP128ICE01ZEM kit
20 SOIC	Included in ZLP128ICE01ZEM kit	20-PDIP to 20-SOIC adapter from Ironwood, P/N SOIC20-02
20 SSOP	Included in ZLP128ICE01ZEM kit	20-PDIP to 20-SSOP adapter from Ironwood, P/N SOIC20-09
28 PDIP	Included in ZLP128ICE01ZEM kit	Included in ZLP128ICE01ZEM kit
28 SOIC	Included in ZLP128ICE01ZEM kit	Included in ZLP128ICE01ZEM kit
28 SSOP	Included in ZLP128ICE01ZEM kit	Included in ZLP128ICE01ZEM kit
40 PDIP	Included in ZLP128ICE01ZEM kit	ZLP323ICE01ZAC
48 SSOP	ZLP323ICE01ZAC	ZLP323ICE01ZAC

Note: *20-SOIC and 20-SSOP adapters are available from Ironwood at* www.ironwoodelectronics.com/.

Technical Information on the IR Development Board

The IR development board shipped with the Crimzon ICE provides a universal remote control development platform for Zilog's ZLP12840 and ZLP32300 families of IR microcontrollers. The board supports both 20-pin and 28-pin PDIP devices without adapters. The adapters and converters described in Table 4 on page 36 provide support for other Crimzon family package types.

For information on Schematics for IR development board, see Schematics on page 60.

IR Development Board Operation

Three-digit codesets enable the IR development board to be used as a remote controller for a variety of devices. The codeset tables are provided in Appendix B–Codesets on page 42.

Applying Power to the Board

Insert the two AAA batteries supplied with the kit into the battery holder on the bottom of the IR development board and set the Battery Power switch to the ON position.

You can also apply an external 3.0 V DC power supply to the board between terminals J7 (Vbat) and J8 (Gnd). (The board supports a voltage range of 2.0 V DC to 3.6 V DC. Match ZDS II project settings to ensure proper operation.)

Enabling the Universal Remote Control Feature

Follow the steps below to enable a universal remote control:

1. To change a device (device can be TV, VCR, CABLE, SAT, and so forth), press and release any device key (for example, a TV, VCR, CABLE or AUX1).
2. To change a code (CODE is the three-digit number for the code selected from Table 8 on page 42 through Table 11 on page 58), press and hold the device key for three seconds. LED D2 stays ON for three seconds and then turns OFF.
3. Release the device key. LED D2 is ON.
4. Press and release the three digit keys one by one. LED D2 stays OFF when pressing a key and ON when the key is released.

5. LED D2 turns OFF if the three-digit code is accepted. If the number is rejected or is invalid, LED D2 blinks quickly eight times. Reenter the code number.

Key Matrix

The IR development platform key matrix has eight rows and columns with two alternate configurations. The default configuration uses the eight port 2 (input) pins as column signals for key press detection and the eight port 0 (output) pins as row signals for the key scanning signal. This configuration provides 64 keys.

The key matrix is provided in Table 4. See Figure 2 on page 4 for key locations.

Table 4. IR Development Board Key Matrix

K1 SUR MODE	K2 TT HOLD SUR ON	K3 YELLOW FRONT	K4 RED CENTER	K5 GREEN REAR	K6 BLUE DELAY	K7 TT OFF DELAY UP	K8 TT ON DELAY DN
K9 DISC	K10 TAPE	K11 TUNER	K12 TELEVISI ON	K13 VIDEO 1	K14 VIDEO 2	K15 AUDIO	K16 TEST
K17 UP ARROW	K18 DOWN ARROW	K19 LEFT ARROW	K20 RIGHT ARROW	K21 DSP_MOD E	K22 DSP_O N	K23 PIP	K24 SWAP
K25	K26 REC	K27 STOP	K28 PLAY	K29 PAUSE	K30 REW	K31 FF	K32 AV
K33 TV	K34 SAT	K35 DVD	K36 1	K37 2	K38 3	K39	K40 CH+
K41 VCR	K42 AMP	K43 AUX	K44 4	K45 5	K46 6	K47 GUIDE	K48 CH-

K49 CABLE	K50 CD	K51 INFO	K52 7	K53 8	K54 9	K55 RECALL	K56 VOL+
K57 POWER	K58 MUTE	K59 MENU	K60 EXIT	K61 0	K62 ENTER	K63 SELECT	K64 VOL-

Learning Circuit

The learning circuit on the ZLP12840/ZLP32300 IR development platform consists of the following components:

- Photo detector D1
- Off-chip IR amplifier Q2, Q3 with related resistors, used only with LP32300 part
- Setup jumpers J2 and J9

When using ZLP12840, the internal on-chip IR amplifier is used to amplify the signal from D1. When using ZLP32300, the off-chip amplifiers, Q2 and Q3 are used to amplify the signal.

Jumper and Switch Settings

The jumpers on the IR development board supplied with the Crimzon ICE function as follows:

- J1—Future use, for factory testing
- J2—Selects device type (ZLP12840 or ZLP32300)
- J3, J4, …, J8—Test points
- J9 pins 1-2—Selects whether external IR amplifier is being enabled by P37, or P37 is used as SCLK
- J9 3-4—Connects P37 to U1.6 (SCLK)
- J9 5-6—Connects P27 to U1.5 (SDA)
- J10—Connects P2 pins to the columns of the keypad

- J11—Connects P0 to the rows of the keypad
- J12—Selects whether LEDs ON/OFF are being controlled by P34
- J13—Selects whether CTS and RTS signals on the RS-232 interface are being shorted. Certain communication software requires these signals to be shorted
- J14—Enables/disables RS-232 interface

Factory settings for IR development board jumpers are described in Table 5.

Table 5. Default Jumper Settings, IR Development Board

Jumper	Description	Pins	Configuration	Default Setting
J2	IR Amplifier	1-2	Connect external IR Amplifier	OUT (for ZLP12840)
J2	IR Amplifier	3-4	IN for direct IR photodiode connection	IN (for ZLP12840)
J2	IR Amplifier	5-6	Connect external IR amplifier	OUT (for ZLP12840)
J9	IR Amplifier	1-2	IN to allow P37 to enable external IR Amplifier	OUT (for ZLP12840)
J9	I^2C Interface	3-4	IN to connect P37 to SCLK of EEPROM	IN
J9	I^2C Interface	5-6	IN to connect P27 to SDA of EEPROM	IN
J10	All Keypad	1-16	Connect keypad column 0-7 to P20-P27	IN
J11	All Keypad	1-16	Connect keypad row 0-7 to P00-P07	IN
J13	RTS-CTS	1-2	Connect RTS and CTS	OUT

Table 5. Default Jumper Settings, IR Development Board (Continued)

Jumper	Description	Pins	Configuration	Default Setting
J14	RS232_EN	1-2	IN to enable Rx OUT to disable Rx (tri-state)	OUT
J14	RS232_SHDN	3-4	IN to disable Tx (tri-state) OUT to enable Tx	IN

Table 6 lists the functions of the four eight-position DIP switches available on the IR development board.

Table 6. IR Development Board DIP Switch Settings

Switch	Description
SW2	Controls the connection of eight LEDs to port 0 when it is configured as output. Default = all OFF
SW3	Controls the pull-up resistors for Port 0. Default = all OFF
SW4	Controls the pull-up resistors for Port 2. Default = all OFF
SW5	Controls the pull-up resistors for Port 3. Default = all ON

Appendix A–Crimzon ICE Commands

Table 7 lists the Crimzon ICE Commands.

Table 7. Crimzon ICE Commands

Command	Description and Options
?	Displays available emulator command shell options
`bpool`	Displays buffer pool
`date`	Displays current date
`debugport`	Configures the TCP port usage: `debugport`—displays current settings `debugport tcp_port`—sets debugport to specified TCP port **Example** `debugport 4040`—sets debugport to TCP port 4040
`devs`	Not used
`echo`	Echoes arguments typed into the command line
`exit`	Exits the command shell
`hang`	Not used
`help`	Displays available emulator commands

Table 7. Crimzon ICE Commands (Continued)

Command	Description and Options

`ifconfig`	Configures the emulator network interface. Entering `ifconfig` with no options lists current configuration.
	
	The following command options are available:
	• `i`—specifies IP address
	• `s`—specifies subnet mask
	• `g`—specifies a network gateway address
	• `dhcp`—configures the emulator network interface to look for a dhcp host to obtain network settings
	
	Example
	`ifconfig i 192.168.1.1 s 255.255.255.0 g 192.165.1.254` configures the emulator to use IP address `192.168.1.1` on subnet `255.255.255.0` with gateway address `192.168.1.254`
	`ifconfig dhcp on`
	configures the emulator to use DHCP

`kill`	Not used
`mem`	displays memory usage information
`password`	Not used
`port`	Displays port information
`ps`	Displays a list of processes running on the ICE by process id number
`reboot`	Reboots the emulator
`restore`	Restores factory default network interface settings
`sem`	Displays semaphore information
`sleep`	Not used
`time`	Displays current time and date

Appendix B–Codesets

Table 8 through Table 11 on page 58 lists the three-digit codesets for the IR development board.

Table 8. Television Brands

Brand	Zilog Code Numbers
Admiral	116 234
Adventura	235
Aiko	126
Akai	63 91 117
Alba	33
Alleron	151
A-Mark	29
Amstrad	90
Amtron	145
Anam	28 29 83 105 145
Anam National	248 249 269
AOC	14 29 99 108 109 118 119 120 251
Archer	29
Audiovox	29 145
Bauer	35
Belcor	118
Bell & Howell	116 183 230
Bradford	145
Brockwood	14 118

Table 8. Television Brands (Continued)

Brand	Zilog Code Numbers
Candle	14 95 97 98 108 118 120 121 235
Capehart	14
Celebrity	117
Circuit City	14
Citizen	18 94 95 96 97 98 101 108 118 120 121 126 145 199 235 236
Colortyme	14 118 120 122 254
Concerto	97 118 120
Contec	49 83
Contec/Cony	123 124 145
Craig	15 83 145
Crown	94 145
Curtis Mathes	94 101 108 115 118 120 125 199 230
CXC	83 145
Daewoo	2 91 92 94 109 118 119 120 126 127 213 214 256
Daytron	14 118 120
Dimensia	115
Dixi	29 52 91
Dumont	14 118
Electroband	117
Electrohome	3 5 94 118 120 128 129 130 269
Elta	91
Emerson	1 12 14 83 84 85 86 87 88 89 90 94 118 120 123 131 132
	133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149
	150 151 152 211 230 236 237 260 270

Table 8. Television Brands (Continued)

Brand	Zilog Code Numbers
Envision	108 118 120
Etron	91
Fisher	50 82 153 154 155 230
Formenti	35
Fortress	39
Fujitsu	15 89 151
Funai	15 83 89 145 151
Futuretec	145
Futuretech	15 83
GE	14 20 80 81 84 102 105 106 111 115 118 120 130 156 187 231 232
	239 269
Genexxa	33
Gibralter	118
Goldstar	14 52 78 79 94 97 109 118 119 120 123 128 129 159 160 161 228
Granada	3 14
Grand	14
Grandiente	3
Grundy	145 151
Hallmark	14 118 120
Harvard	145
Hinari	89
Hitachi	3 10 24 71 72 73 74 75 76 77 94 97 118 120 123 124 163
	164 218 221 222 223 224 237 253

Table 8. Television Brands (Continued)

Brand	Zilog Code Numbers
Hitachi Pay TV	273
IMA	145
Infinity	64 165
Janeil	235
JBL	64 165
JC Penney	46 81 94 101 108 109 111 115 118 119 120 121 130 156 161 166 167
	174 187 199 239 255
JCB	117
Jensen	70 118 120
JVC	66 67 68 69 123 124 163 168 169 229 240
Kawasho	65 117 118 120
Kenwood	108 118 120 128 129
Kloss	36 98 235
Kloss Novabeam	170 171 241
KTV	83 84 85 94 145 172 236
Lloyds	14
Loewe	165
Logik	183 266
Luxman	97 118 120
LXI	25 30 47 50 64 111 115 120 153 165 173 174 175 230 239
Magnavox	4 36 64 95 99 108 118 120 121 128 165 170 171 176 177 178 184
	188 215 216 217 241 267
Majestic	183

Table 8. Television Brands (Continued)

Brand	Zilog Code Numbers
Marants	165 52 64 108 118 120 165 179
Matsui	91
Megatron	14 120
Memorex	14 50 91 116 120 182 183 230 266
MGA	14 62 108 109 110 118 119 120 128 129 130 155 180 182
Midland	239
Minutz	156
Mitsubishi	7 14 27 61 62 63 109 110 118 119 120 128 129 130 155 180 181
	182 212
Motorola	234 269
MTC	14 97 101 108 109 118 119 120 199
Multitech	145
NAD	14 30 112 120 173 174 243
National	13 105 13
NEC	23 97 100 107 108 109 118 119 120 129 185 254 269
Nikkai	33 34
Nikko	14 120 126
Normande	0
NTC	126
Onwa	83 145
Optimus	243
Optonica	37 39 192 234
Orion	15 142 260
Osaki	34

Table 8. Television Brands (Continued)

Brand	Zilog Code Numbers
Panasonic	6 11 12 13 60 64 104 105 106 165 263 265 269
Philco	36 95 108 109 118 119 120 121 123 128 165 170 171 176 178 184 241
	267 269
Philips	52 64 118 121 123 128 165 170 171 177 186 187 188 269 176
Pilot	118
Pioneer	59 77 112 118 120 189 190 237 243 264
Portland	94 109 118 119 120 126
Price Club	199
Proscan	111 115 239
Proton	14 26 94 103 120 123 191 244 118
Pulsar	113 118
Quasar	11 105 106 172 263 269
Radio Shack	34 37 83 94 115 118 120 123 145 153 192 230
RCA	16 17 25 53 54 55 56 57 58 77 102 109 111 115 118 119 120
	128 193 194 196 197 239 245 256 269 273 274
Realistic	50 118 120 123 145 153 192 230
Saisho	90 91
Sampo	108 118 120
Samsung	0 8 14 34 52 91 94 97 101 108 109 118 119 120 123 125 127
	128 129 198 255
Sansui	260
Sansung	199
Sanyo	49 50 51 82 118 153 154 180 200 230

Table 8. Television Brands (Continued)

Brand	Zilog Code Numbers
SBR	52
Schneider	52
Scotch	120
Scott	83 87 89 94 118 120 123 132 142 145 151
Sears	9 14 30 40 41 42 43 44 45 46 47 50 51 82 89 97 111
	118 120 124 128 129 151 153 154 155 169 173 174 201 202 230 239
Seimitsu	14
Sharp	21 22 37 38 39 49 94 118 120 123 137 192 203 205 210 234
Shogun	118
Siemens	49
Signature	116 183 266
Simpson	121
Sony	114 117 259 268 272
Soundesign	14 83 95 118 120 121 145 151
Spectricon	29 99
Squareview	15
SSS	83 109 118 145
Starlite	145
Supra	97
Supre-Macy	98 235
Supreme	117
Sylvania	35 36 64 95 108 118 120 121 128 165 170 171 176 177 178 188 207
	241 267 184
Symphonic	15 145 270

Table 8. Television Brands (Continued)

Brand	Zilog Code Numbers
Tandy	33 39 234
Tatung	105 237 269
Technics	106
Techwood	97 118 120 157
Teknika	31 32 83 89 94 95 96 97 98 101 109 110 118 119 120 121 123
	124 126 145 151 177 182 183 199 266
Teletech	91
Tera	103 244
Thomas	14
Thompson	5
TMK	14 97 118 120
Toshiba	19 30 46 50 101 153 173 174 199 201 230 255
Totevision	94
Toyomenko	14
Universal	81 156 187
Vector Research	108
Victor	69 169 240
Video Concepts	63
Vidtech	14 109 118 119 120
Viking	98 235
Wards	37 81 89 102 108 109 116 118 119 120 128 132 151 156 156 165 170
	171 176 177 183 184 187 188 192 208 209 266 267 268 270
Yamaha	108 109 119 120 128 129

Table 8. Television Brands (Continued)

Brand	Zilog Code Numbers
York	14
Zenith	113 118 183 226 227 261 266 271
Zonda	29

Table 9. VCR Brands

Brand	Zilog Code Numbers
Admiral	154
Aiko	169
Aiwa	21
Akai	75 76 77 136 137 138 139 140 156 157 141 155
Alba	115
Amstrad	21
ASA	101
Asha	160
Audio Dynamics	12
Audio Dynamics	158
Audiovox	161
Beaumark	160
Broksonic	159
Broksonic	167
Bush	20

Table 9. VCR Brands (Continued)

Brand	Zilog Code Numbers
Calix	161
Candle	17 160 161 162 163
Canon	108 117
Capehart	115 116
Capeheart	74 164
Carver	36
CCE	35 169
Citizen	17 18 160 161 162 163 169
Colt	35
Craig	5 18 35 160 161 165
Curtis Mathes	8 17 78 108 153 163 166 160
Cybernex	160
Daewoo	74 114 115 123 167 169 170 162
Daytron	74 115
DBX	12 158
Dumont	112
Dynatech	21
Electrohome	4 161 171
Electrophonic	161
Emerson	4 19 21 23 38 77 79 142 143 144 145 146 147 159 161 162 166 167
	171 173 174 175 176 177 178 179 180
Fisher	3 5 21 25 26 28 29 80 86 112 113 165

Table 9. VCR Brands (Continued)

Brand	Zilog Code Numbers
GE	8 18 30 52 78 108 109 110 111 153 160
Go Video	106 107
Goldstar	2 17 31 126 161
Goodmans	20
Gradiente	168
Grundig	101
Harley Davidson	168
Harman Kardon	98 126
Harwood	35
Hinari	20
Hi-Q	165
Hitachi	15 16 21 32 33 72 75 118 119 120 121 122
JC Penney	11 12 18 72 80 108 126 158 160 161
Jensen	32 75
JVC	11 12 17 75 82 102 103 104 105 158
Kenwood	11 12 17 75 82 89 104 158 163
KLH	35
Kodak	161
Lloyd	21 168
Logik	20 35
LXI	161

Table 9. VCR Brands (Continued)

Brand	Zilog Code Numbers
M. Wards	4 5 6 18 19 20 21 108 129
Magnavox	36 37 101 108 129
Magnin	160
Marantz	10 11 12 17 36 101 108 158 163
Marta	161
MEI	108
Memorex	5 21 89 100 108 112 124 154 160 161 165 168
MGA	4 38 77 99 171
MGN Technology	160
Midland	30
Minolta	32 72
Mitsubishi	4 32 38 39 40 41 42 44 45 46 47 71 77 82 97 98 99 104
	171
Motorola	154
MTC	21 160 168
Mukltitech	160
Multitech	30 35 163 168 18 20 21
NAD	96
NEC	9 10 11 12 13 17 49 50 51 75 82 104 125 126 158
Nikko	161
Noblex	160
Optimus	154 161
Optonica	65

Table 9. VCR Brands (Continued)

Brand	Zilog Code Numbers
Panasonic	1 14 73 108 130 132 133 134 135
Pentax	17 32 72 121 163
Perdio	21
Philco	36 37 108
Philips	65 101 108 181 36
Pilot	161
Pioneer	12 32 52 53 82 93 94 95 96 104 158
Portland	74 115 163
Proscan	8 52 129 153
Protec	35
Pulsar	124
Quartz	89
Quasar	91 92 108
Radio Shack	3 4 5 6 26 65 154 160 161 165 168 171
Radix	161
Randex	161
RCA	0 7 8 18 32 52 54 55 56 57 60 61 62 72 78 121 127 128
	129 130 131 153 155 160
Realistic	21 26 65 86 89 108 112 154 160 161 165 168 171
Ricoh	150
Saisho	145 146
Salora	89 99
Samsung	18 30 76 90 110 123 138 156 160 162 174

Table 9. VCR Brands (Continued)

Brand	Zilog Code Numbers
Sanky	154
Sansui	12 63 75 82 104 125 158
Sanyo	5 87 88 89 112 160 165
SBR	101
Schneider	20
Scott	19 38 64 144 159 162 167 173
Sears	3 5 25 26 28 32 72 80 86 89 112 113 161 165
Sentra	115
Sharp	4 6 65 65 171
Shintom	20 35
Shogun	160
Singer	35
Sony	148 149 150 151 152
STS	72
Sylvania	21 36 37 38 99 108 168
Symphonic	21 168
Tandy	21
Tashiko	21 161
Tatung	11 75 85
Teac	11 21 56 75 168
Technics	73 108
Teknika	21 22 67 108 161 168
TMK	146 160 166

Table 9. VCR Brands (Continued)

Brand	Zilog Code Numbers
Toshiba	19 26 28 32 38 64 99 123 162
Totevision	18 160 161
Unitech	160
Vector Research	12 126 158 162 163
Victor	12 104 105 158
Video Concepts	12 77 158 162 163
Vid-eosonic	18 160
Wards	32 35 48 65 68 69 70 72 154 160 161 162 165 168 171
XR-1000	35 168
Yamaha	11 12 17 75 126 158
Zenith	124 151 152

Table 10. Cable Brands

Brand	Zilog Code Numbers
ABC	7 8 9 10
Archer	11 12
Century	12
Citizen	12
Colour Voice	13 14
Comtronic	15
Eastern	16

Table 10. Cable Brands (Continued)

Brand	Zilog Code Numbers					
Garrard	12					
Hytex	7					
Jasco	12					
Jerrold	5	17	18	30	9	10
Magnavox	19					
Movie Time	20					
NSC	20					
Oak	0	21	7			
Panasonic	1	6				
Philips	24	12	13	14	19	
Pioneer	2	3	25			
RCA	34					
Regency	16					
Samsung	26	15				
Scientific Atlanta	3	4	27	28		
Signal	15					
SL Marx	15					
Starcom	10					
Stargate	15					
Televiev	15					
Tocom	8	17				
TV86	20					
Unika	12					
United Artists	7					

Table 10. Cable Brands (Continued)

Brand	Zilog Code Numbers		
Universal	12	11	
Viewstar	20	19	
Zenith	3	32	33

Table 11. Satellite Brands

Brand	Zilog Code Numbers		
Alphastar	19		
Chaparral	0	1	
Cheyenne	1		
Dishnet	18		
Drake	2		
Drake	3		
Echostar Dish	27		
GE	13	20	21
General Instruments	4	5	6
Hitachi	23	24	
Hughes Network	17	28	
JVC	22		
Magnavox	25		
Philips	25		
Primestar	16		
Proscan	20	21	13

Table 11. Satellite Brands (Continued)

Brand	Zilog Code Numbers			
RCA	13	20	21	
Realistic	7			
Sierra	1			
Sony	14			
STS	8	9	10	11
Toshiba	12	15		
Uniden	26			

Schematics

Figure 17 displays the layout of the 20-pin Target Pod.

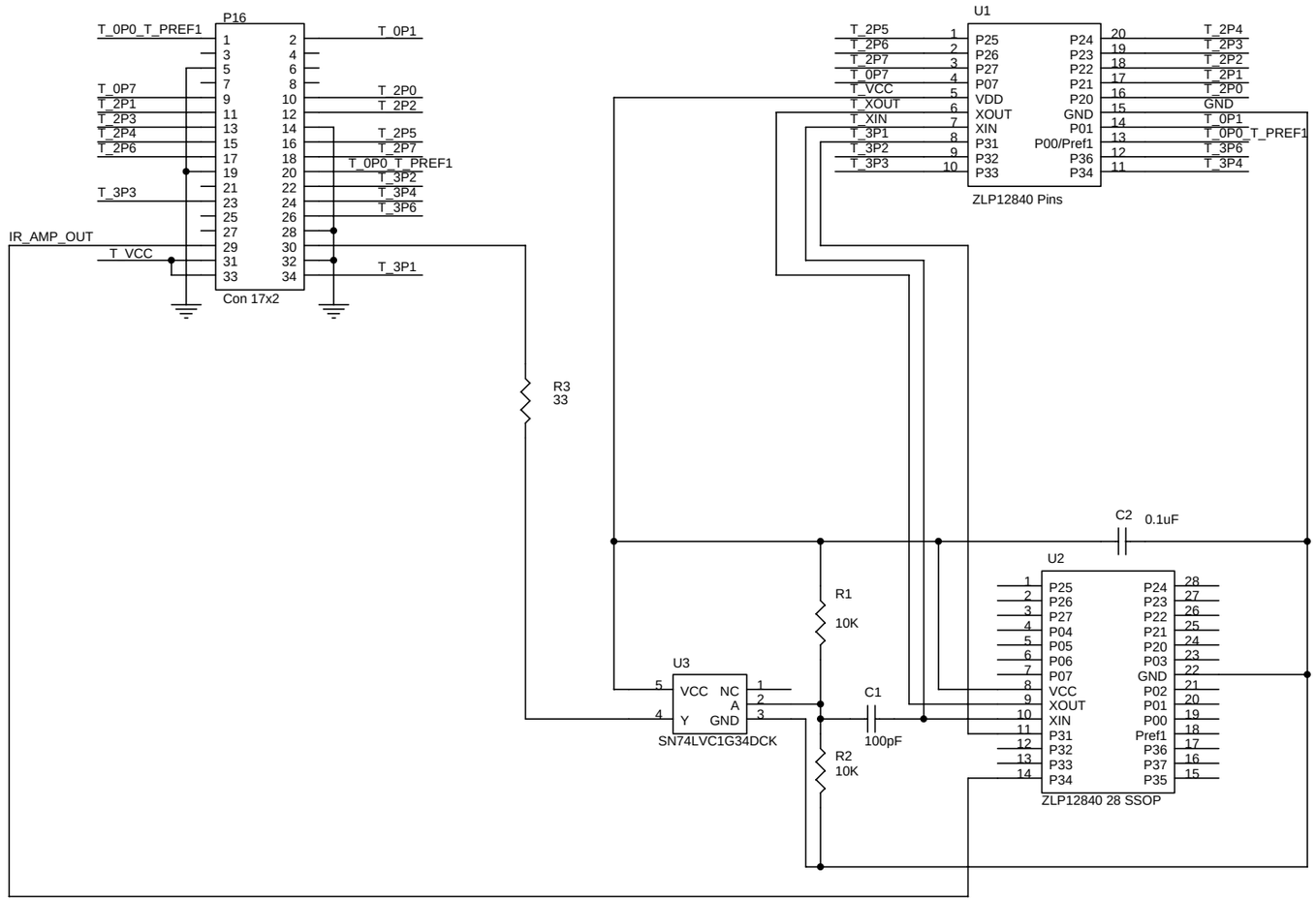


Figure 17. 20-Pin Target Pod

Figure 18 displays the layout of the 28-pin Target Pod.

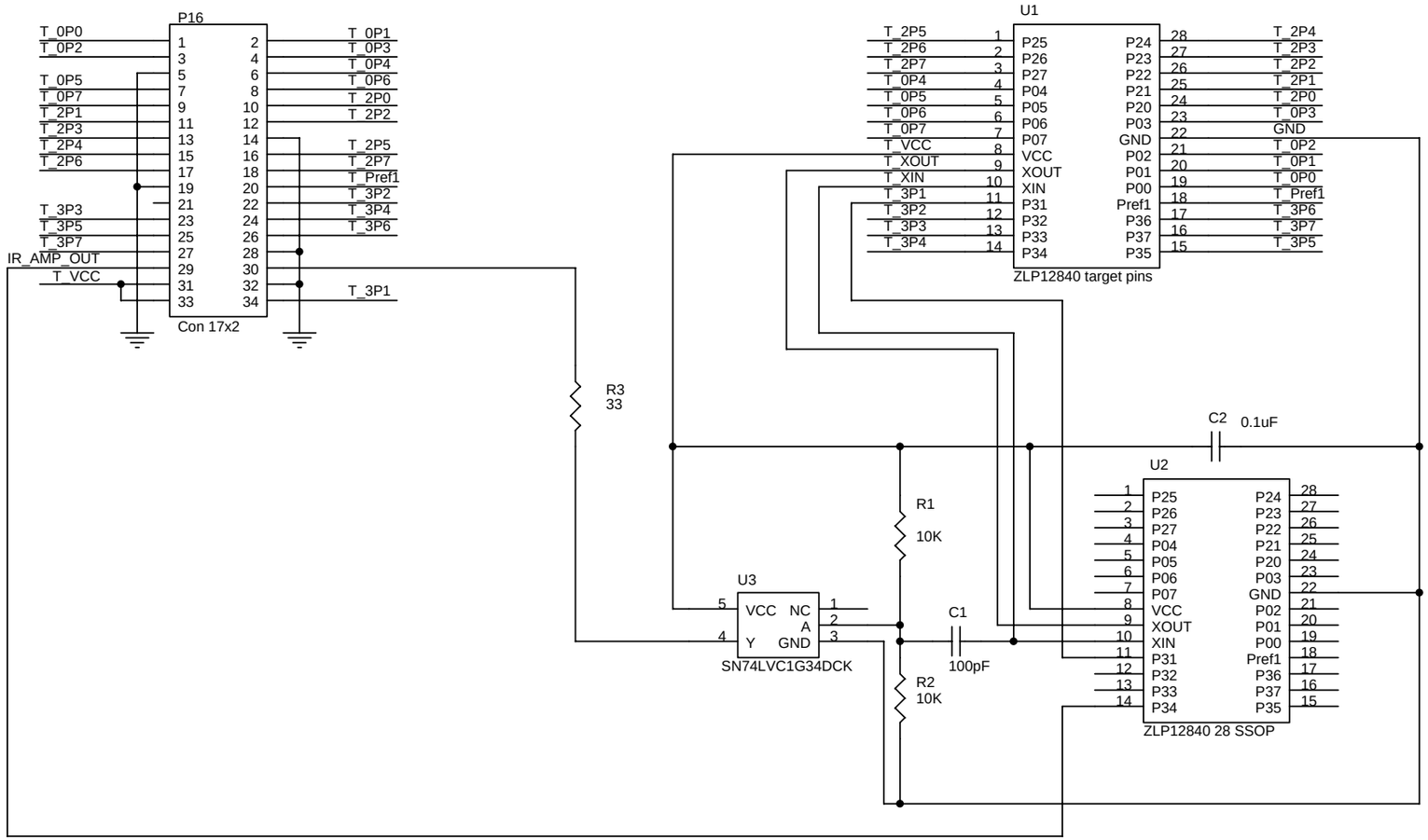


Figure 18. 28-Pin Target Pod

Figure 19 displays the layout of the 40-pin Target Pod.

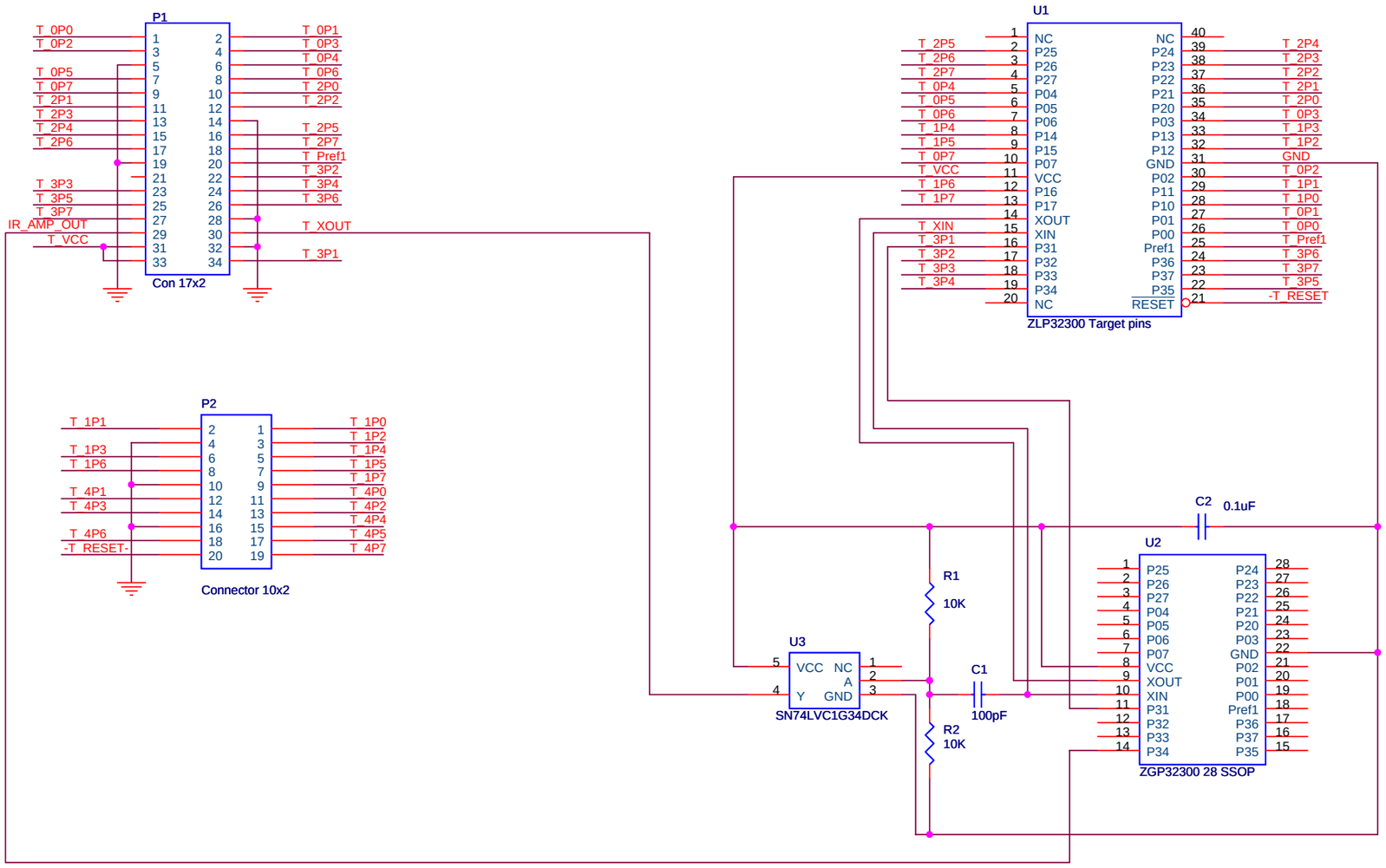
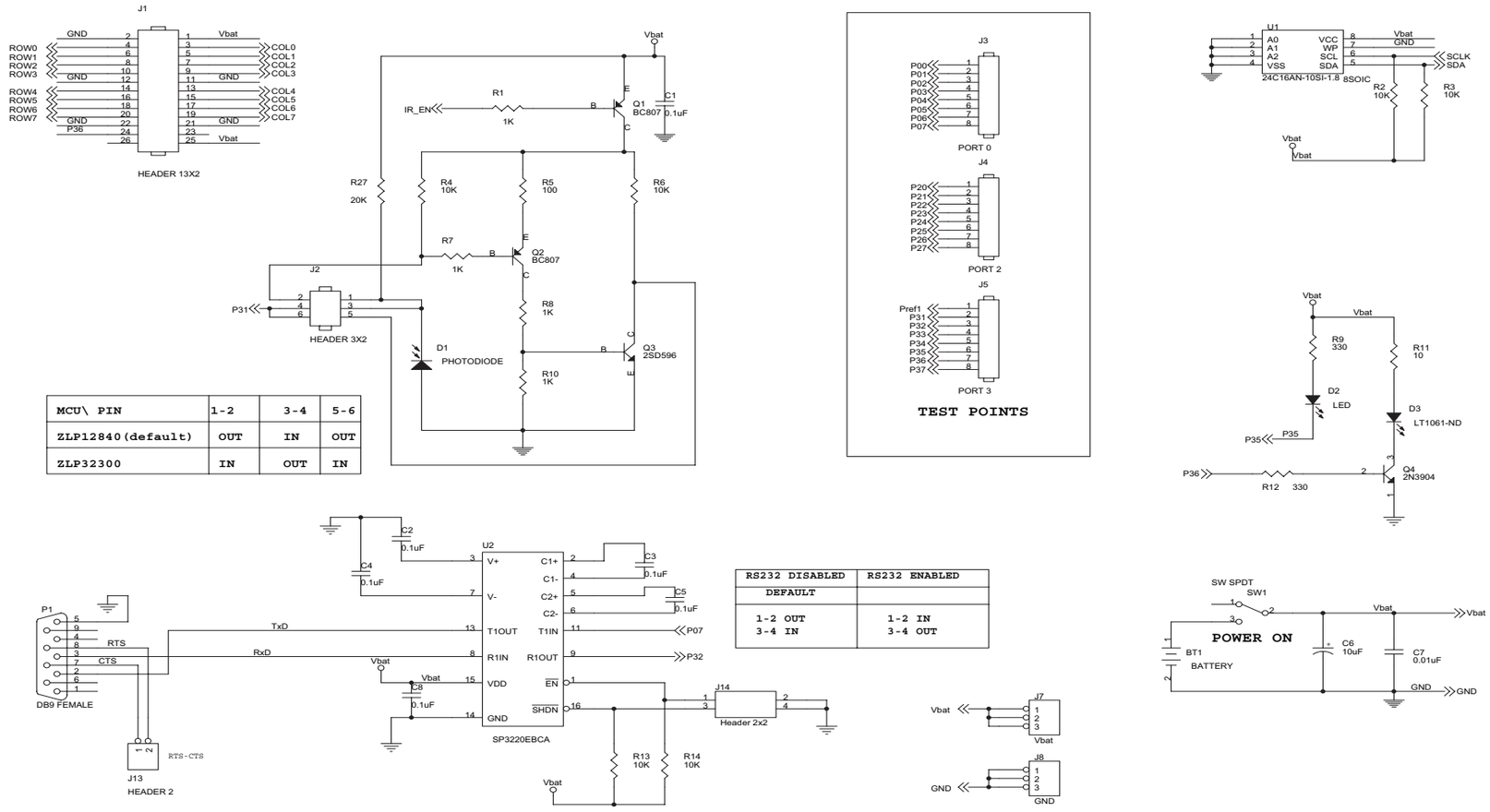


Figure 19. 40-Pin Target Pod

Figure 20 and Figure 21 display the layout of the IR Development Board.



MCU\ PIN	1-2	3-4	5-6
ZLP12840(default)	OUT	IN	OUT
ZLP32300	IN	OUT	IN

RS232 DISABLED	RS232 ENABLED
DEFAULT	
1-2 OUT 3-4 IN	1-2 IN 3-4 OUT

Figure 20. IR Development Board

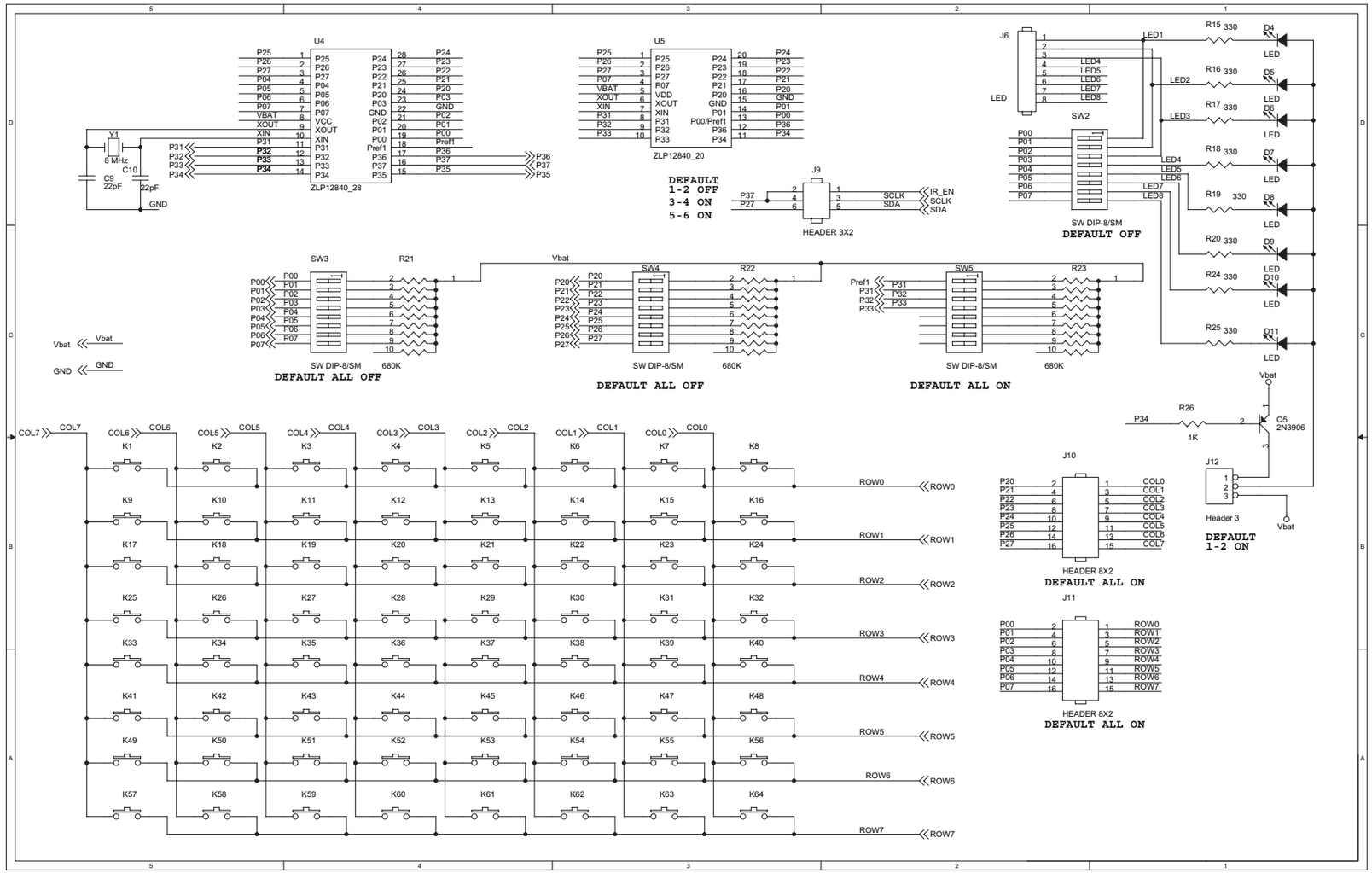


Figure 21. IR Development Board (Continued)

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For any comments, detail technical questions, or reporting problems, please visit Zilog's Technical Support at http://support.zilog.com.

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